

Notes on Turtle Egg Predation by *Lampropeltis getulus* (Linnaeus) (Reptilia: Colubridae) on the Savannah River Plant, South Carolina

JAMES L. KNIGHT

*Savannah River Ecology Laboratory,  
Drawer E, Aiken, South Carolina 29801*

AND

RAYMOND K. LORAINE<sup>1</sup>

*Museum of Natural History,  
University of Kansas, Lawrence, Kansas 66045*

**ABSTRACT.**— Observations on turtle egg predation by the colubrid snake *Lampropeltis getulus* on the Savannah River Plant, South Carolina, indicate that, during the turtle nesting season, some kingsnakes apparently search out and consume the contents of multiple turtle nests. This seems especially true for nests of kinosternid turtles. Future studies of predators on turtle nests within the range of *L. getulus* should take that taxon into account as a potentially prominent predator. Eggs of *Sternotherus odoratus* may hatch even after passing through the digestive tract of *L. getulus*.

Kingsnakes of the colubrid genus *Lampropeltis* have long been known to feed on a wide variety of vertebrate prey (for a review, see Wright and Wright 1957). Of particular interest is the tendency of these snakes to consume the eggs of other reptiles, especially turtles. Brown (1979) listed two turtle eggs from two *Lampropeltis getulus*, and Hamilton and Pollack (1956) listed prey items found in *L. getulus* from Fort Benning, Georgia, including the eggs of lizards and snakes. Wright and Bishop (1915) reported the eggs of *Pseudemys floridana* and *Kinosternon* spp. from stomachs of Okefenokee swamp *L. getulus* and observed that “. . . so addicted are they [*L. getulus*] to this egg diet, that the natives consider that it is a common happening to find the snake awaiting the egg deposition.” They also said that, aside from “the Florida bear, there is no form in the swamp which eats turtle’s eggs in such quantity as the kingsnake. It will take a whole nest of eggs at one time, as many as 14 being found in the stomach of one snake.” Ernst and Barbour (1972) cite numerous turtle species whose young are eaten by various species of snakes, but relatively few turtles whose eggs are eaten.

<sup>1</sup> Present address: Department of Zoology, University of South Florida, Tampa, Florida 33620.

Recent collections and observations on two specimens of *L. getulus* from the Savannah River Plant (SRP), in Aiken, Barnwell and Allendale counties, South Carolina, shed additional light on turtle egg-eating propensities of *L. getulus* and indicate that at least a small subset of the population of *L. getulus* on the SRP may search out nesting turtles and wait for them to lay their eggs, as suggested by Wright and Bishop (1915).

On 27 May 1984, one of us (RKL) removed a *L. getulus* from a funnel snake trap along a drift fence near the northeast side of Ellenton Bay, a Carolina bay in the Aiken County portion of the SRP. This snake, a female with a snout-vent length (SVL) of 1118 mm, regurgitated 9 turtle eggs (6 ruptured, 3 intact) that, based on shape, appeared to represent several different turtle taxa. One hard-shelled egg was immediately referable to the family Kinosteridae; one was light-colored and round, apparently *Chelydra*; and the remaining 7 could have been assignable to any of several species of emydid turtles.

On 22 June 1984, one of us (JLK) collected a female *L. getulus* (1257 mm SVL) along a sandy road that courses parallel to, and averages about 50 m from, the edge of the Savannah River Swamp, ca. 2 km east-southeast of the mouth of Pen Branch Creek, in Barnwell County. The collector had stopped to capture a *Terrapene carolina* that was in the process of excavating a nest chamber (she later laid 3 eggs in the lab). When first observed, the snake was less than a meter from the turtle, with its head and neck elevated about 10 to 12 cm off the ground and directed toward the turtle. The snake was captured, placed in a collecting bag and, upon returning to the lab, was found to have regurgitated 4 hard-shelled eggs (2 intact, 1 damaged, 1 crushed). The snake was caged by itself and, after 3 days, defecated parts of, minimally, an additional 13 kinosternid eggs, 3 of them unbroken.

Three species of kinosternid turtles have been collected at SRP: *Sternotherus odoratus* and *Kinosternon subrubrum* (Gibbons and Patterson 1978), and *Kinosternon bauri* (Lamb 1983). The eggs are most likely of *S. odoratus* and/or *K. subrubrum*, as *K. bauri* is comparatively rare on the SRP, the northernmost record of occurrence for the species. Unfortunately, measurements of the intact eggs yielded no information as to their identity, for all three species lay eggs of approximately the same size.

Of particular interest was the number of turtle eggs present in the second snake. Gibbons (1983), discussing SRP *K. subrubrum*, gave a mean of 3.03 eggs/clutch, range 1-5 (N = 161). Tinkle (1961) divided a sample of adult female *S. odoratus* into two arbitrary size classes, the smaller exhibiting an average clutch size of 2.0 eggs and the larger aver-

aging 3.2 eggs/clutch. If the snake located and devoured "average" clutches of *K. subrubrum*, then at least five or six different nests had been preyed upon, all within a fairly short period. If the same scenario is applied to "average" clutches of *S. odoratus*, the snake may have preyed on five to nine nests. Given the circumstances of its capture, it seems highly probable that the snake would have taken the contents of the *T. carolina* nest as well. Interestingly, the three intact eggs that passed through the digestive system of the snake and were then defecated were incubated in the lab and hatched after approximately 50 days, yielding three *S. odoratus*.

Imler (1945) mentioned a bullsnake, *Pituophis melanoleucus sayi*, with an "egg appetite to the extent that it will not eat anything else," and Legler (1960), citing a conversation with the late E. H. Taylor, mentioned a bullsnake that "swallowed an entire clutch of newly laid eggs [of *Terrapene ornata*] before the female turtle could cover the nest." Perhaps some individual *L. getulus* behave the same way in nature. Legler (1960) stated that nest predation may have a greater effect on populations than predation on hatchlings, juveniles, and adults. Our data suggest that *L. getulus*, particularly those in areas of extensive turtle nesting, as along the margin of the Savannah River Swamp, might contribute more than slightly to turtle egg predation totals. Any future studies of predation on turtle eggs should take this predator into account.

**ACKNOWLEDGMENTS.**— Thanks go to R. A. Seigel, J. Iverson, and S. Novak for commenting on earlier drafts of this paper; R. A. Estes for field assistance; S. J. Morreale for incubating and hatching the *S. odoratus* eggs; and J. W. Gibbons for the opportunity to collect and report these observations. Manuscript preparation was supported by contract DE-AC09-76SR00819 between the U.S. Department of Energy and the University of Georgia's Savannah River Ecology Laboratory.

#### LITERATURE CITED

- Brown, E. E. 1979. Some snake food records from the Carolinas. *Brimleyana* 1:113-124.
- Ernst, Carl H., and R. W. Barbour. 1972. *Turtles of the United States*. Univ. Kentucky Press, Lexington.
- Gibbons, J. Whitfield. 1983. Reproductive characteristics and ecology of the mud turtle, *Kinosternon subrubrum* (Lacépède). *Herpetologica* 39(3): 254-271.
- \_\_\_\_\_, and K. K. Patterson. 1978. The reptiles and amphibians of the Savannah River Plant. *National Environmental Research Park* 2:1-24.

- Hamilton, W. J., and J. A. Pollack. 1956. The food of some colubrid snakes from Fort Benning, Georgia. *Ecology* 37(3):519-526.
- Imler, R. H. 1945. Bullsnares and their control on a Nebraska wildlife refuge. *J. Wildl. Manage.* 9(4):265-273.
- Lamb, Trip. 1983. The striped mud turtle (*Kinosternon bauri*) in South Carolina, a confirmation through multivariate character analysis. *Herpetologica* 39(4):383-390.
- Legler, John M. 1960. Natural history of the ornate box turtle, *Terrapene ornata ornata* Agassiz. *Univ. Kans. Publ. Mus. Nat. Hist.* 11(10):527-669.
- Tinkle, Donald W. 1961. Geographic variation in reproduction, size, sex ratio and maturity of *Sternothaerus odoratus* (Testudinata: Chelydridae). *Ecology* 42(1):68-76.
- Wright, Albert H., and S. C. Bishop. 1915. II. Snakes. Pages 139-192 in *A biological reconnaissance of the Okefinokee swamp in Georgia: The reptiles.* *Proc. Acad. Nat. Sci. Phila.*: 107-192.
- , and A. A. Wright. 1957. *Handbook of Snakes of the United States and Canada.* 2 vols. Comstock Publ. Assoc., Ithaca, N.Y.

*Accepted 30 July 1985*